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NEW SPECIES AND RECORDS OF PACIFIC AMPELISCIDAE (CRUSTACEA: AMPHIPODA)

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Ampeliscidae from the east tropical and warm-temperate Pacific Ocean and from warm-temperate Japan collected by the "*Albatross*," "*Velero III*," and individual collectors are reported upon in this paper. These records and descriptions complete an inventory of all Pacific Ocean materials of this family collected by the two expeditionary vessels, on which previous reports have been made by Holmes (1908), Shoemaker (1925), and J. L. Barnard (1954a, 1960, 1964a). Ampeliscidae are among the most dominantly occurring families of sublittoral and bathyal depths. Of particular interest are three new species of *Byblis* from Japan which demonstrate a remarkable diversity in that genus.

This study was supported by the Richard Rathbun Fund of the Smithsonian Institution and was part of a project organized by Dr. Fenner A. Chace, Jr., to complete the analysis of important expeditionary collections deposited in the U.S. National Museum. The writer is grateful also to the Beaudette Foundation of California for assistance in the completion of the work in 1960.

Station data are presented in the list below. Depths are quoted in fathoms as in the original data, but in the sections on distribution of

species they are converted to meters to conform to international practice.

List of Localities

Albatross Station Records

2787, Golfo de Penas, Chile, 46°47′30″S, 75°15′00″W, 61 fms, green mud, Feb. 9, 1888

2798, Pearl Islands, Panama, 08°10′30″N, 78°50′30″W, 18 fms, gray sand, broken shells, Mar. 5, 1888

2799, Bay of Panama, 08°44′00″N, 79°09′00″W, 29.5 fms, green mud, Mar. 6, 1888

2824, Greater Bay of La Paz, Gulf of California, 24°22′30″N, 110°19′30″W, 8 fms, broken shells, Apr. 30, 1888

2831, Magdalena Bay, Baja California, 24°32′00″N, 111°59′00″W, 12 fms, fine gray sand, May 2, 1888

2834, near San Juanico Bay, Baja California, 26°14′00″N, 113°13′00″W, 48 fms, yellow mud, May 3, 1888

2835, near Punta Abreojos, Baja California, 26°42′30″N, 113°34′15″W, 5.5 fms, green mud, May 4, 1888

2837, Cedros Island, Baja California, 28°10′00″N, 115°09′45″W, 23 fms, fine sand, May 5, 1888

2911, Cortes Bank, Calif., 32°27′30″N, 119°05′00″W, 60 fms, rock, sand, Jan. 16, 1889

2922, Cortes Bank, Calif., 32°27′15″N, 119°05′15″W, 47 fms, fine gray sand, Jan. 17, 1889

2969, Santa Barbara Channel, Calif., 34°20′40″N, 119°37′45″W, 26 fms, gray sand, pebbles, stones, Feb. 11, 1889

3138, Monterey Bay, Calif., 36°55′30″N, 122°02′00″W, 19 fms, fine sand, mud, stones, Mar. 15, 1890

3187, near Pt. Sur, Calif., 36°14′00″N, 121°58′40″W, 298 fms, yellow sand, mud, Apr. 3, 1890

3195, near Morro Bay, Calif., 35°14′00″N, 121°07′00″W, 252 fms, green mud, Apr. 5, 1890

3566, San Diego Bay, Calif., 3 fms, fine sand, broken shells, Mar. 19, 1894

3698, Manazuru Zaki, N 8°, W 4.5 m, off Honshu Island, Japan, 153 fms, green mud, vol. a. s., May 5, 1900

3702, Seno Umi, N 13°, W 1.5 m, off Honshu, Japan, 31–41 fms, volcanic mud, sand, rock, May 7, 1900

3708, Ose Zaki, S 55°, W 2.25 m, off Honshu Island, Japan, 60–70 fms, green mud, volcanic sand, May 8, 1900

3716, Ose Zaki, S 36°, W 0.8 m, off Honshu Island, Japan, 65–125 fms, volcanic sand, shells, rock, May 11, 1900

3738, Ent. Port Heda, N 84°, E 1.2 m, off Honshu Island, Japan, 167 fms, stiff blue mud, May 17, 1900

3739, Ose Zaki, S 25°, W 0.25 m, off Honshu Island, Japan, 55–65 fms, volcanic sands, shells, rock, May 17, 1900

3767, Oboro Saki, N 67°, E 2.3 m, off Honshu Island, Japan, 14–18 fms, gray sand, June 5, 1900

3769, Nagane Saki, N 55°, E 5.3 m, off Honshu Island, Japan, 40–42 fms, green mud, sand, June 5, 1900

3771, Doumiki Saki, N 19°, W 4.5 m, off Honshu Island, Japan, 61 fms, green mud, sand, June 5, 1900

3809, Honolulu Light, N 28°, E 2′, Hawaii, 51–125 fms, fine coral sand, black specks, Mar. 27, 1902
4322, Soledad Hill, Point La Jolla, Calif., S 34°, E 3.2 miles, 110–199 fms, green mud, shells, Mar. 7, 1904
5091, Joga Shima Lt., N 15°, W 4.2 miles, 35°04′10″N, 139°38′12″E, Uraga Strait, Japan, entrance to Gulf of Tokoyo, 197 fms, green mud, coarse black sand, pebbles, Oct. 26, 1906

Velero III Station Records

221, off Gorgona Island, Colombia, 03°01′25″N, 78°10′00″W, 20 fms, rock, shell, Feb. 12, 1934
224, off Gorgona Island, Colombia, 02°59′45″N, 78°13′20″W, 10 fms, gravel, shell, Feb. 12, 1934
257, off South Viradores Islands, Port Culebra, Costa Rica, 10°35′00″N, 85°43′15″W, 10 fms, sand, shells, Feb. 25, 1934
268, north of White Friars, Mexico, 17°31′30″N, 101°29′27″W, 25 fms, coarse sand, Mar. 3, 1934
420, off Port Utria, Colombia, 05°58′00″N, 77°21′15″W, 35 fms, mud, sand, Jan. 25, 1935
460, Playa Blanca, Costa Rica, 10°56′00″N, 85°52′50″W, 3–5 fms, sand, shells, Feb. 8, 1935
562, east of San Esteban Island, Gulf of California, 28°41′25″N, 112°32′15″W, 20–70 fms, sand, rock, Mar. 10, 1936

Collected by Dr. Waldo L. Schmitt

1, Salinas, Ecuador, littoral, Sept. 12, 1926
10, just north of Paita, Peru, dredged off coast, Oct. 7, 1926
24, off passage between San Lorenzo and adjacent island, Callao Bay, Peru, dredged with scallop trawl, Nov. 7, 1926

Collected by Dr. E. F. Ricketts, Pacific Biological Laboratories

24–10, Pacific Grove, Calif., channel, rock, 70 fms, Apr. 13 1928
28–5, Pacific Grove, Calif., channel, rock, 80 fms Apr. 18, 1928
125–1, Monterey Bay, Calif., mud, 65 fms, June 22, 1930
125–2, Monterey Bay, Calif., rocks, 80 fms, June 27, 1930

Miscellaneous

Hemphill 5733, San Diego, Calif.
Hilton A–4, Laguna Beach, Calif., Aug. 5, 1918

Ampeliscidae

Ampelisca brevisimulata J. L. Barnard

Ampelisca brevisimulata J. L. Barnard, 1954a, pp. 33–35, pls. 23–24; 1954b, p. 7; 1964a, p. 212.

Material: *Albatross* 2837 (2).

Record: Cedros Island, Baja California, 23 fms.

Distribution: Eastern Pacific Ocean from Monterey Bay, Calif., to Panama, 11–172 m; Caribbean Sea off Colombia and Venezuela, 9–38 m.

Ampelisca compressa Holmes

Ampelisca compressa Holmes, 1905, pp. 480–481, 1 fig.—Kunkel, 1918, p. 66.—J. L. Barnard, 1960, pp. 31–32; 1964b, p. 101, chart 4; 1964a, p. 213.
Ampelisca vera J. L. Barnard, 1954a, pp. 23–26, pls. 14–16; 1954b, p. 3, pl. 1, figs. k–l.

Material: *Albatross* 2834 (3), 2835 (5), 2837 (6).

Records: Near San Juanico Bay, Baja California, 48 fms; near Punta Abreojos, Baja California, 5.5 fms; Cedros Island, Baja California, 23 fms.

Distribution: Western Atlantic Ocean; Caribbean Sea; Pacific Ocean from Panama to Puget Sound, Wash., 1–266 m.

Ampelisca cristata Holmes

Ampelisca cristata Holmes, 1908, pp. 507–508, figs. 16–17.—J. L. Barnard, 1954a, pp. 26–29, pls. 17–18 (includes forma *microdentata*); 1954b, pp. 3–4, pl. 1, figs. a–g (includes forma *microdentata*); 1959, p. 18 (forma *microdentata*); 1964a, p. 213.

Material: *Albatross* 2835 (5), 2911 (3), 2922 (1), 3566 (1). *Velero* 420 (1).

Records: Near Punta Abreojos, Baja California, 5.5 fms; Cortes Bank, California, 47–60 fms; San Diego Bay, Calif., 3 fms; off Port Utria, Colombia, 35 fms.

Distribution: Eastern Pacific Ocean from Tomales Bay, Calif., to La Plata Island, Ecuador, 6–152 m; Caribbean Sea, off Venezuela and Colombia, ca. 9–42 m.

Ampelisca cristoides J. L. Barnard

Ampelisca cristoides J. L. Barnard, 1954a, pp. 29–31, pls. 19–20; 1954b, p. 4, pl. 1, figs. h–j.

Material: *Albatross* 2798 (1). *Velero* 224 (1), 257 (3), 268 (1).

Records: Pearl Islands, Panama, 18 fms; Gorgona Island, Colombia, 10 fms; South Viradores Islands, Costa Rica, 10 fms; N of White Friars, Mexico, 25 fms.

Distribution: Eastern Pacific Ocean from Thurloe Head, Baja California, to Gorgona Island, Colombia, ca. 9–73 m; Caribbean Sea off north coast of Colombia, ca. 24–40 m.

Ampelisca eoa Gurjanova

Ampelisca eoa Gurjanova, 1951, pp. 313–314, fig. 178.—J. L. Barnard, 1960, p. 25.
Ampelisca catalinensis J. L. Barnard, 1954a, pp. 7–9, pls. 1–2.

Material: *Albatross* 3698 (8), 3738 (1).

Records: Honshu Island, Japan 153–167 fms.

Distribution: Bering Sea, 1000 m; Honshu Island, Japan, 280–330 m; offshore basins of southern California, 421–1, 833 m.

***Ampelisca eschrichtii* Krøyer**

FIGURE 1*o*

Ampelisca Eschrichtii Krøyer, 1842, p. 155.—Sars, 1895, pp. 174–176, pl. 61, fig. 1.—Stephensen, 1925, pp. 139–141.

Ampelisca eschrichtii.—Stebbing, 1906, p. 100.—Shoemaker, 1930, pp. 27–28; 1931, pp. 9–10.

Ampelisca eschrichti.—Stephensen, 1933, pp. 23–24, fig. 9 (map); 1935, pp. 121–123.

Ampelisca eschrichti eschrichti.—Gurjanova, 1955, p. 170, fig. 169.

The shape of the head and article 2 of pereopod 5 distinguish this species from *A. maorocephala* Liljeborg. The obliquely truncated ventral margin of pereopod 5 is a contrast to the transversely truncated margin in *A. macrocephala* (see Stephensen, 1935). In *A. eschrichtii* the ventrolateral corneal lens occurs posterior to the anteroventral cephalic corner, and the ventral cephalic margin posterior to the lens is straight or convex, not excavate as in *A. macrocephala.* The ventrolateral lens of *A. macrocephala* forms the corner of the head. The presence or absence of a long distal spine on the outer ramus of uropod 2 is an invalid character in distinguishing the two species, as both species have the spine (contra J. L. Barnard, 1954a, key).

The Pacific specimens at hand seemed so unlike Sars' (1895) drawings of *A. eschrichtii* that the materials were compared with similar large specimens (20–27 mm) from the western Atlantic Ocean in Smithsonian collections. These large individuals differ materially from Sars' drawings in several conspicuous characters: the shortened uropod 1; the deeper recessment of the ventral pair of corneal lenses; and the greater convexity of the ventral cephalic margin posterior to the lenses. Pacific and some western Atlantic materials are comparable in these characters. A specimen from Bedford Basin, Halifax, Nova Scotia (reported in Shoemaker, 1931), has uropod 1 reaching only halfway along the rami of uropod 2; specimens from Hebron, Labrador, 1908, 75 fms, have uropod 1 reaching two-thirds along the rami of uropod 2; and specimens from Ungava Bay (1883, USNM 9413) have uropod 1 extending to the end of the rami of uropod 2 as shown by Sars (1895). The specimens from Ungava Bay are remarkable also for the development of a high dorsal crest on the posterior pereonal and anterior pleonal segments.

Gurjanova (1955) has figures of *A. eschrichtii eschrichtii* and her *A. e. pacifica* with uropod 1 extending about two-thirds along the rami of uropod 2; *A. e. pacifica* has the indented ventral corneal lens and slightly tumid ventral cephalic margin. Specimens at hand have these characters more exaggerated than previously shown. A representative head is given in figure 1*o*. The Pacific specimens are justifiably identified as *A. eschrichtii,* sensu lato, and this extends the range

of the species in the Pacific as far south as Monterey Bay, California. That may be the southern limit because in the time since my (1954a) paper I have examined more than 600 samples and tens of thousands of specimens of *Ampelisca* from southern California, 200 miles south of Monterey, and have never found a specimen of *A. eschrichtii* (paper in preparation). Samples extended from depths of 4 to 1500 m.

There can be no confusion of *A. eschrichtii* with the southern Californian *A. indentata* which has a similar head, because the latter has a large lobe on article 4 of pereopod 5, a strongly saddle-shaped dorsal carina on urosomite 4 and virtually no tooth on pleonal epimeron 3, all in contradistinction to *A. eschrichtii.*

Material: *Albatross* 3187 (9), 3195 (29).

Records: Near Pt. Sur and near Morro Bay, Calif., 252–298 fms.

Distribution: Circumpolar in the northern hemisphere, with known southern limits as follows: The deep sea (1375 m) off Atlantic France (SW of Ireland); sublittoral depths of Georges Bank, east of Massachusetts (41°25′N); bathyal depths off Morro Bay, California; and "Japan Sea" (Gurjanova, 1951), ca. 10–800 m.

Ampelisca furcigera Bulycheva

Ampelisca furcigera Bulycheva, 1936, pp. 242–244, figs. 1–3.—Gurjanova, 1938, p. 256, fig. 4; 1951, pp. 314–316, fig. 180.—J. L. Barnard, 1960, pp. 26–27, fig. 6.

Material: *Albatross* 3698 (1), 3739 (1), 5091 (1).

Records: Honshu Island, Japan 65–153 fms; Uraga Strait, Gulf of Tokyo, Japan, 197 fms.

Distribution: Bering and Okhotsk Seas, Japan, 60–361 m; eastern Pacific Ocean in offshore basins of southern California, 212–386 m.

Ampelisca hancocki J. L. Barnard

Ampelisca hancocki J. L. Barnard, 1954a, pp. 37–38, pl. 26; 1964a, p. 213.

Material: Pacific Biological Laboratories 125–1 (1).

Records: Monterey Bay, Calif., 65 fms.

Distribution: Eastern Pacific Ocean from Monterey Bay, Calif., to Costa Rica, 9–157 m.

Ampelisca indentata J. L. Barnard

Ampelisca indentata J. L. Barnard, 1954a, pp. 43–45, pl. 30; 1964a, pp. 213–214.

Material: *Albatross* 2837 (1).

Record: Cedros Island, Baja California, 23 fms.

Distribution: Eastern Pacific Ocean from about Pt. Conception, Calif., into the Gulf of California, 33–98 m.

Ampelisca lobata Holmes

Ampelisca lobata Holmes, 1908, pp. 517–518, fig. 25.—Shoemaker, 1921, p. 99; 1941, p. 187; 1942, p. 7.—J. L. Barnard, 1954a, pp. 11–14, pls. 5–6; 1954b, p. 2; 1964a, p. 214.
Ampelisca articulata Stout, 1913, pp. 639–640.

Material: *Velero* 562 (1). Schmitt 1 (5). Pacific Biological Laboratories 125–2 (4). Hemphill 5733 (6). Hilton A–4 (1).

Records: San Esteban Island, Baja California, 20–70 fms; Salinas, Ecuador, littoral; Monterey Bay, Calif., rocks, 80 fms.; San Diego Bay, Calif.; Laguna Beach, Calif.

Distribution: Eastern Pacific Ocean from Monterey Bay, Calif., to Lobos de Afueras Islands, Peru, and the Galapagos Islands, 0–183 m but rare in depths exceeding 30 m; Caribbean Sea, off Colombia, Aruba, and Barbados Islands, 9–70 m.

Ampelisca mexicana J. L. Barnard

Ampelisca mexicana J. L. Barnard, 1954a, pp. 45–46, pls. 31–32; 1954b, p. 7; 1964a, p. 214.

Material: *Albatross* 2799 (1).

Record: Bay of Panama, 29.5 fms.

Distribution: Eastern Pacific Ocean from Punta Canoas, Baja California, to Independencia Bay, Peru, 9–73 m; Caribbean Sea: Caledonia, Panama, ca. 18 m.

Ampelisca miharaensis Nagata

Ampelisca miharaensis Nagata, 1959, pp. 70–73, figs. 3–5; 1960, p. 168; 1965, pp. 152–153, fig. 4 (subfigs. 2–4).

Material: *Albatross* 3698 (1), 3702 (1), 3708 (2).

Record: Honshu Island, Japan, 41–153 fms.

Distribution: Japan, 2–280 m.

Ampelisca milleri J. L. Barnard

Ampelisca milleri J. L. Barnard, 1954a, pp. 9–11, pls. 3–4.—Jones, 1961, pp. 253–254.—J. L. Barnard, 1964a, p. 215.

Material: Pacific Biological Laboratories 125–1 (1).

Record: Monterey Bay, Calif., 65 fms.

Distribution: Eastern Pacific Ocean from San Francisco Bay, Calif., to Ecuador, and the Galapagos Islands, 0–187 m.

Ampelisca misakiensis Dahl

Ampelisca misakiensis Dahl, 1944, pp. 6–9, figs. 4–6.—Nagata, 1965, p. 152. fig. 5 (subfigs. 3–6).

Material: *Albatross* 3702 (1), 3708 (1).

Record: Honshu Island, Japan, 31–60 fms.

Distribution: Warm-temperate Japan, 30–110 m.

Ampelisca pugetica Stimpson

Ampelisca pugetica Stimpson, 1864, pp. 158–159.—J. L. Barnard, 1954a, pp. 49–51, pls. 35–36 (includes forma *macrodentata*); 1954b, p. 7; 1960, p. 31, fig. 9; 1964a, p. 215.
Ampelisca californica Holmes, 1908, pp. 513–515, fig. 23.
Ampelisca gnathia J. L. Barnard, 1954a, pp. 46–48, pls. 33–34.

Material: *Albatross* 2831 (1), 2837 (5), 4322 (1).

Records: Magdalena Bay, Baja California, 12 fms; Cedros Island, Baja California, 23 fms; La Jolla, Calif., 110–199 fms.

Distribution: Eastern Pacific Ocean from Puget Sound, Wash., to Todos Santos Island, Baja California (*pugetica pugetica*), from Pt. Fermin, Calif., to Peru and the Galapagos Islands (*pugetica macrodentata*), 0–183+ m; Caribbean Sea off Venezuela, Colombia, and Aruba, 24–42 m.

Ampelisca romigi J. L. Barnard

Ampelisca romigi J. L. Barnard, 1954a, pp. 18–20, pls. 10–11; 1954b, p. 3; 1960, p. 34; 1964a, pp. 215–216.
Ampelisca isocornea J. L. Barnard, 1954a, pp. 20–21, pl. 12.

Material: *Albatross* 2824 (1). Pacific Biological Laboratories 24–10 (1), 28–5 (1).

Records: Greater Bay of La Paz, Gulf of California, 8 fms; Pacific Grove, Monterey Bay, Calif., 70–80 fms.

Distribution: Eastern Pacific Ocean from Monterey Bay, Calif., to Santa Elena Bay, Ecuador, 3–504 m, probably inhabiting only very coarse sediments (rubble, gravel) and thus rarely occurring in shallow water of high latitudes because of absence of substrate; Caribbean Sea, north shore of Colombia and Aruba, 24–42 m.

Ampelisca schellenbergi Shoemaker

FIGURES 1*a–m*

Ampelisca schellenbergi Shoemaker, 1933, pp. 3–5, fig. 2; 1942, p. 9.—J. L. Barnard, 1954a, pp. 14–16, pls. 7–8; 1954b, p. 2.

Material: *Albatross* 3809 (86). *Velero* 221 (10), 224 (1), 562 (1). Schmitt 1 (5). Pacific Biological Laboratories 24 (8).

Records: Off Honolulu, Hawaii, 51–125 fms; Gorgona Island, Colombia, 20 fms (2 records); San Esteban Island, Baja California, 20–70 fms; Salinas, Ecuador, littoral; Pacific Grove, Calif., 70 fms, channel.

Notes on Hawaiian material: Antenna 1 variable, in the largest specimen scarcely exceeding article 4 of antenna 2 peduncle, in other smaller females reaching nearly three-fourths along article 5, in most young males reaching halfway or fully along article 5 and occasionally exceeding it slightly; antenna 2 in female approximately three-fourths as long as body, in young males as long as body; young male antennae

stouter than in female, with stouter flagellar articles; base of flagellum of antenna 1 slightly more setose, but young males lacking setal

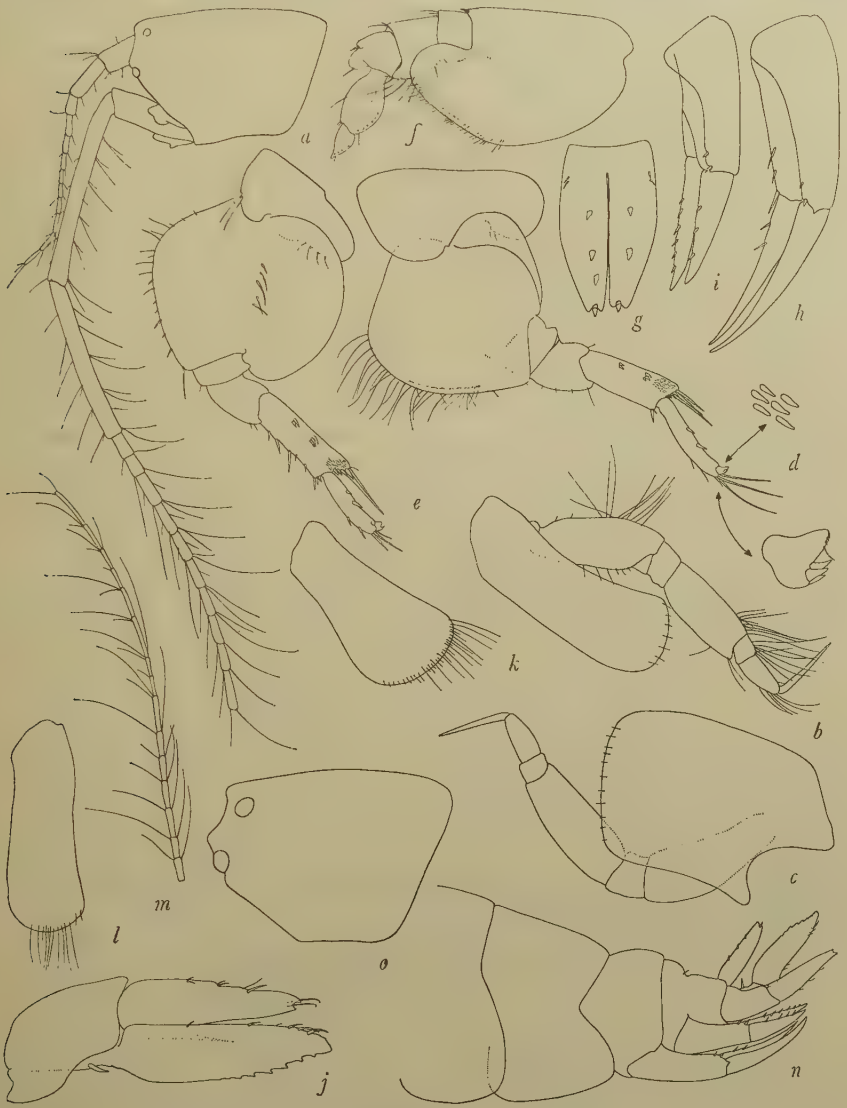

FIGURE 1.—*Ampelisca schellenbergi* Shoemaker, *Albatross* 3809, female, 7.6 mm: *a*, head; *b–f*, pereopods 1–5; *g*, telson; *h–j*, uropods 1–3; *k*, *l*, coxae 1, 2; *m*, continuation of antenna 2 from fig. *a*; *n*, pleonites 2–6, left lateral (5–6 coalesced). *Ampelisca eschrichtii* Krøyer, female, 20.0 mm, *Albatross* 3195: *o*, head.

tufts typical of adult ampeliscas (no fully adult males at hand); dactyl of pereopod 3 with 3 accessory spines but only 1 on pereopod

4; submarginal medial row of setae on posteroventral edge of article 2 on pereopod 5 more densely packed than in American population; notch and distal end of article 5 with slight ochraceous bulbosities appearing almost lenslike; posterior edges of articles 6–7 with row of small pits similar to stridulating ridges; coxae 1–3 each with 1 small posteroventral slit; peduncle of uropods 1 and 2 without ventrolateral setules occurring on continental American specimens.

Remarks: The members of this one population are consistent in the condition of their third uropods as reflected by the accompanying illustration, unlike the variation shown for *A. schellenbergi* by J. L. Barnard (1954a), and none of the young males has any sexual differentiation on uropod 3.

The Hawaiian population of this species has been compared with Caribbean samples used by Shoemaker in his description of the species and with samples from the eastern Pacific Ocean described by J. L. Barnard (1954a). The scabrous condition of pereopods 3–4 noted in the Hawaiian specimens and the ornamental pits of pereopod 5 also occur in the others. Individuals from all 3 areas have a few serrate spines in the distal groups on article 5 of pereopods 3–4.

Distribution: Hawaiian Islands, "93–229" m; eastern Pacific Ocean from Laguna Beach, Calif., to Lorenzo Island, Peru, 0–"128" m, but probably rare in depths esceeding 40 m; western Atlantic Ocean from Florida, Yucatan, and Panama, 0–46 m.

Ampelisca shoemakeri J. L. Barnard

Ampelisca shoemakeri J. L. Barnard, 1954a, pp. 39–40, pls. 27–28; 1964a, p. 216.

Material: *Albatross* 2837 (29). Schmitt 10 (2).

Records: Cedros Island, Baja California, 23 fms; north of Paita, Peru.

Distribution: Eastern Pacific Ocean from Cedros Island, Baja California, to Paita, Peru, 7–76 m.

Byblis albatrossae, new species

FIGURE 2

Diagnosis of female: Head with distinct rostrum about one-third as long as article 1 of antenna 1, anterior cephalic margin with strong angular protrusion, anteroventral cephalic margin deeply excavate for reception of antenna 2; ventral pair of corneal lenses situated at and forming rounded anteroventral cephalic angle, arranged so as to point obliquely anteroventrally, dorsal pair of lenses enormous, about 1.5 times as large as ventral pair, protruding strongly; antenna 1 nearly as long as peduncle of antenna 2, article 2 more than twice as long as article 1 and more than half as long as article 4 of antenna 2;

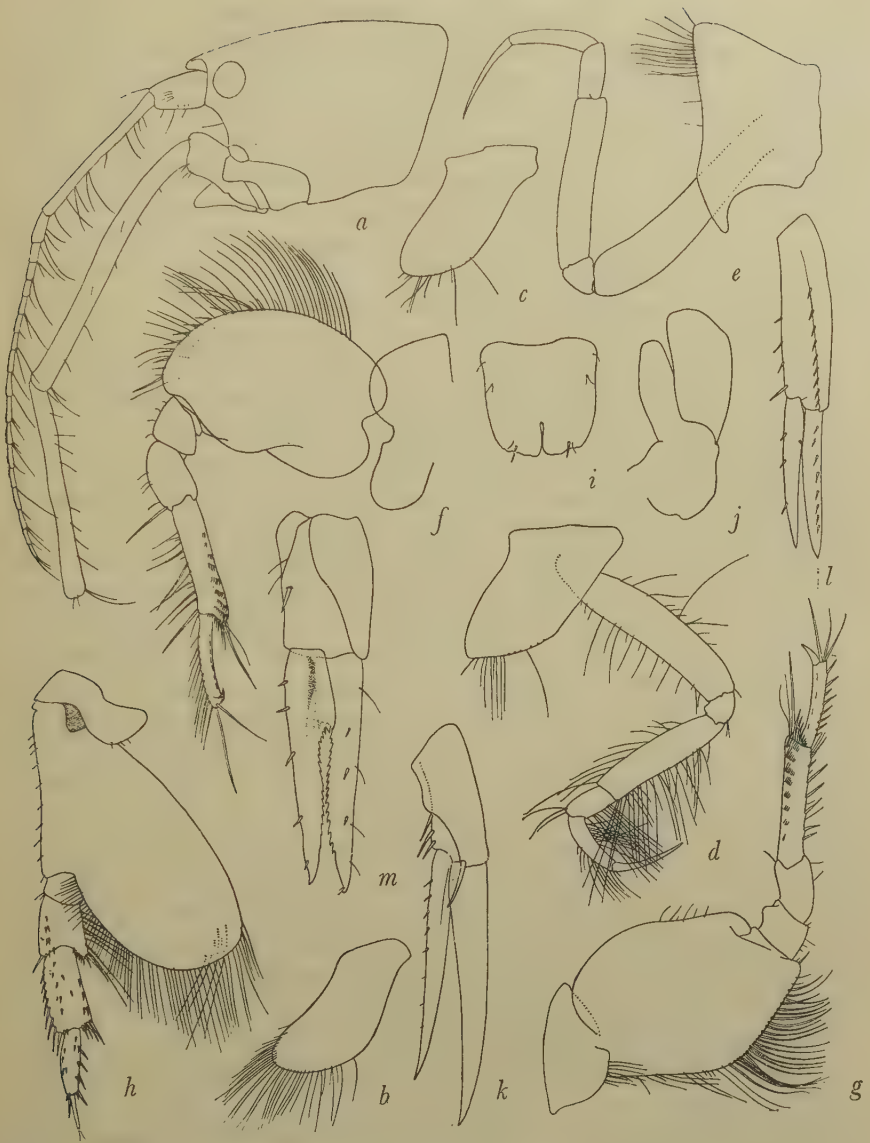

FIGURE 2.—*Byblis albatrossae*, new species, female, holotype, 15.0 mm, *Albatross* 3738: *a*, head; *b*, *c*, coxae 1, 2; *d–h*, pereopods 1–5; *i* ,telson; *j*, outline of maxilla 2, minus setae; *k–m*, uropods 1–3, latter enlarged.

article 4 of antenna 2 longer than peduncle of antenna 1 and much longer than article 5 of antenna 2, flagellum 4 times as long as article 5 of peduncle; anterior coxae unserrate ventrally, shallow, pointing very strongly anteroventrad, coxae 3 and 4 progressively more truncated ventrally, coxa 4 with long, flat ventral margin and narrow posterior tooth; pereopods 1–2 scarcely disproportionate in size, dactyls slightly longer or subequal in length to their respective sixth articles, pereopod 2 more strongly setose than pereopod 1; pereopods 3–4 without special modifications, posterior bilobation of article 2 on pereopod 3 especially symmetrical for genus; article 2 of pereopod 5 with typical overall shape but ventral margin evenly rounded, article 6 about 80 percent as long as article 5, article 7 slightly more than half as long as article 6; uropod 1 extending to end of uropod 2 but with disproportionately short peduncle and long rami, distolateral apex of peduncle with long, slender spine, outer ramus longer than inner and lacking spines, inner ramus with basal ridge for locking outer ramus; uropod 2 with hooked distolateral cusp on peduncle, outer ramus with more than twice as many marginal spines as inner ramus; uropod 3 typically forcipiform, apposing margins of rami strongly serrate; telson of medium length, cleft about one-third.

Remarks: Pleonal epimera are similar to those of *Byblis affinis* (in Sars, 1895, pl. 65). Mouthparts are similar to those of *B. gaimardi* (in Sars, 1895, pl. 65), but article 2 of the mandibular palp is expanded proximally in asymmetrical fashion, each inner plate of the maxillipeds has 2 spine-teeth, and the outer plate of maxilla 2 is slightly broader and distally expanded.

Male: Two specimens, 15 and 13 mm long, have article 5 of antenna 2 nearly as long as article 4, and antenna 1 is equal to or exceeds the peduncle of antenna 2 by the length of 2 flagellar articles.

Holotype: USNM 111268, female, 15.0 mm.

Type locality: *Albatross* 3738, entrance to Port Heda, off Honshu Island, Japan, 167 fms, May 17, 1900.

Material: *Albatross* 3698 (3), 3738 (3).

Records: Manazuru Zaki and Port Heda, Honshu Island, Japan, 153–167 fms.

Relationship: In some ways this species resembles *B. veleronis* J. L. Barnard (1954a), but the disproportionate corneal lenses, the angular protrusion on the anterior margin of the head, and the shape of coxa 4 distinguish *B. albatrossae*. The shape of the anterior 4 pairs of coxae and the first antennal length relate this species to one being described by M. Imbach from Viet Nam, but numerous other characters of that species distinguish it: serrate anterior coxae, equal ocular lenses, straight anterior cephalic margin, more deeply cleft telson, and the form of article 2 on pereopod 3.

The distinct rostrum of *B. albatrossae* prompts comparison with *Haploops securiger* K. H. Barnard (1932) which I transfer to *Byblis*. That species also has a distinct but much longer rostrum, and its ventral pair of corneal lenses is situated beneath the head and concealed from lateral view.

Distribution: Honshu Island, Japan, 280–329 m.

Byblis ampelisciformis, new species

FIGURE 3

Diagnosis of male: Rostrum vestigial, anterior cephalic margin lacking protrusion, anteroventral cephalic margin sinuously excavate for reception of antenna 2, strongly oblique; two pairs of corneal lenses of medium and subequal size, ventral pair situated at and forming rounded anteroventral angle, pointing anterolaterally; antenna 2 as long as body, antenna 1 reaching nearly three-fourths along full length of antenna 2, article 2 of peduncle 2.5 times as long as article 1 and nearly as long as article 4 of peduncle on antenna 2; anterior coxae serrate ventrally, coxa 4 of medium width, slightly truncate ventrally, posterior tooth of medium size; pereopods 1–2 scarcely disproportionate in size, dactyls slightly longer than their respective sixth articles; pereopods 3–4 without special modifications; article 2 of pereopod 5 with typical overall shape, article 6 about 67 percent as long as article 5, article 7 about 40 percent as long as article 6; uropods 1 and 2 of normal proportions, distolateral end of uropod 1 peduncle with stout spine, of uropod 2 with hooked cusp, spines of peduncles and rami remarkably short and stout; rami of uropod 3 furciform, short, asetose, medial margin of inner ramus lined with short spines, ventromedial margin of outer ramus bearing several scales, typical serrations absent; telson short, very broad, cleft halfway; urosome slightly miniaturized in comparison to other species of genus.

Remarks: Mouthparts are similar to those of *Byblis gaimardi* (Krøyer) (*in* Sars, 1895, pl. 64), but the outer plate of maxilla 2 is expanded distally very slightly and article 2 of the mandibular palp is asymmetrically expanded. Pleonal epimera are rounded posteriorly and resemble those of *B. crassicornis* Metzger (*in* Sars, 1895, pl. 66). The medial surface of article 2 of pereopod 5 is densely setose.

Female: Similar to male.

Holotype: USNM 111271, male, 12.0 mm.

Type locality: *Albatross* 3708, Ose Zaki, off Honshu Island, Japan, 60–70 fms, May 8, 1900.

Material: *Albatross* 3708 (3), 3716 (1).

Records: Ose Zaki, Honshu Island, Japan, 70–125 fms.

Relationship: This species resembles *B. veleronis* J. L. Barnard,

B. japonicus Dahl, and *B. erythrops* Sars in the following characteristics: Corneal lenses present, lower pair visible laterally, pereopod 2 similar to pereopod 1, telson cleft a third or more, antenna 1 subequal

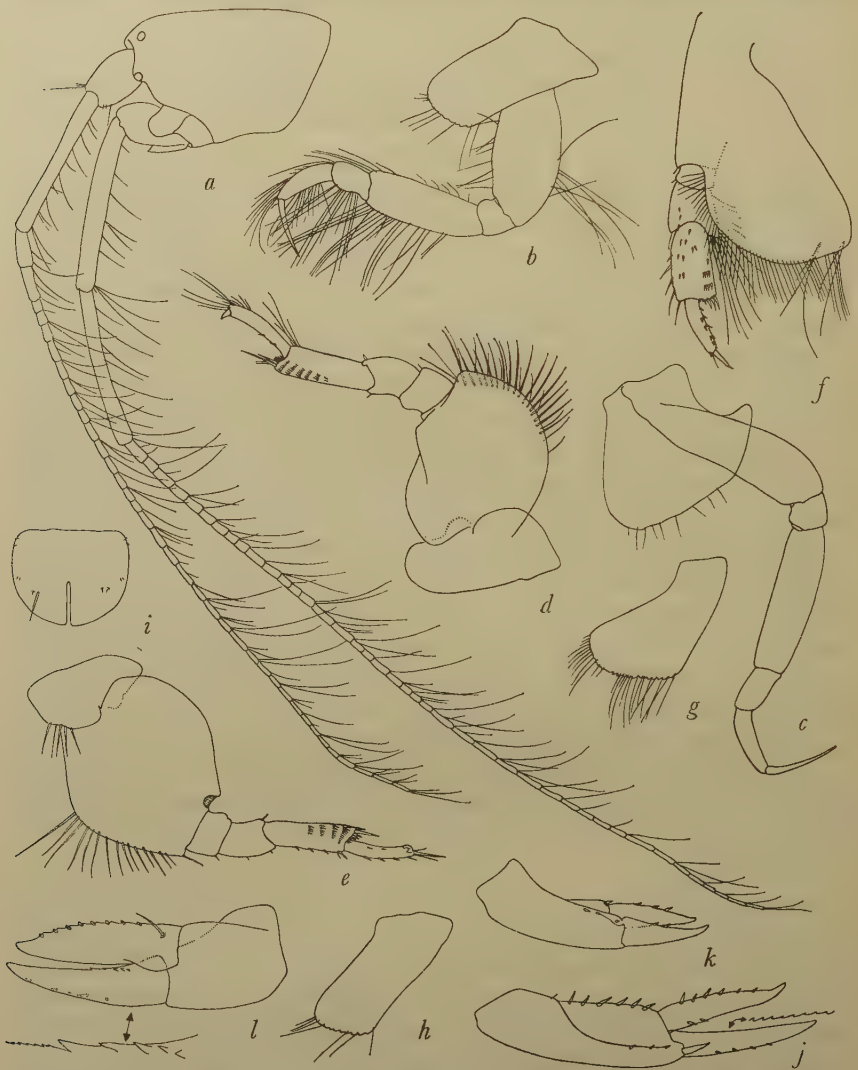

FIGURE 3.—*Byblis ampelisciformis*, new species, male, holotype, 12.0 mm, *Albatross* 3708: *a*, head; *b–f*, pereopods 1–5; *g*, *h*, coxae 1, 2; *i*, telson; *j–l*, uropods 1–3, latter enlarged.

to antenna 2 or greatly exceeding peduncle of antenna 2, pereopod 4 lacking a cusp on article 2. The new species differs from the others in its unusual third uropods with short blunt spines and furciform appearance. Indeed, few other species of *Byblis* are known to have

these uropods which are suggestive of the following species of *Ampelisca: lobata* Holmes (females only), *bidentata* Schellenberg, *scabripes* Walker, and *excavata* K. H. Barnard. From the literature, those species appearing to resemble *B. ampelisciformis* in their third uropods are *B. antarctica* Schellenberg (1931) which lacks corneal lenses and has a large distal protrusion on article 5 of pereopod 3, and *B. subantarctica* Schellenberg (1931) which has a very distinctive pereopod 5, no ventral lenses, and which is transferred to *Ampelisca*.

Distribution: Honshu Island, Japan, 128–228 m.

Byblis orientalis, new species

FIGURE 4

Diagnosis of male: Rostrum vestigial, anterior cephalic margin with small protrusion, anteroventral cephalic margin with short, regular excavation for reception of antenna 2; two pairs of corneal lenses of medium and subequal size, ventral pair pointing anterolaterally, situated at and forming rounded anteroventral cephalic angle; antenna 2 as long as body, antenna 1 reaching about three-fourths along article 5 of antenna 2, article 2 of peduncle almost twice as long as article 1 and slightly more than one-third as long as peduncular article 4 of antenna 2; anterior coxae unserrate ventrally, coxa 4 of medium width, not truncate ventrally but posteroventral margin beveled and posterior tooth therefore very slender; pereopods 1–2 scarcely disproportionate in size, dactyls shorter than their respective sixth articles; pereopods 3–4 without special modifications, article 2 of pereopod 5 with typical overall shape, but neither as strongly expanded nor as ventrally extended as in many species of *Byblis*, articles 5 and 6 equal in length, article 7 about half as long as article 6; uropods 1 and 2 of normal proportions, distolateral end of uropod 1 peduncle with stout spine, of uropod 2 with weakly hooked cusp, spines of peduncles and rami of normal size; uropod 3 typically forcipiform, apposing margins of rami weakly serrate; telson of medium length, cleft about one-third.

Remarks: Mouthparts are like those of *B. gaimardi* (Krøyer) (in Sars, 1895, pl. 64) except for the expanded article 2 of the mandibular palp and the stouter spines of the outer plates of the maxillipeds. Article 2 of pereopod 5 is covered medially with setae. Male antennae lack setal tufts on the peduncles. The holotype has the best developed dorsal subcrest on urosomite 1 of any of the specimens. The anterior cephalic protrusion is also best developed on the figured holotype.

Female: Antenna 1 extending along antenna 2 only about 2 flagellar articles beyond article 4.

Holotype: USNM 111274, male, 11.0 mm.

Type locality: *Albatross* 3769, Nagane Saki, off Honshu Island, Japan, 40–42 fms, June 5, 1900.

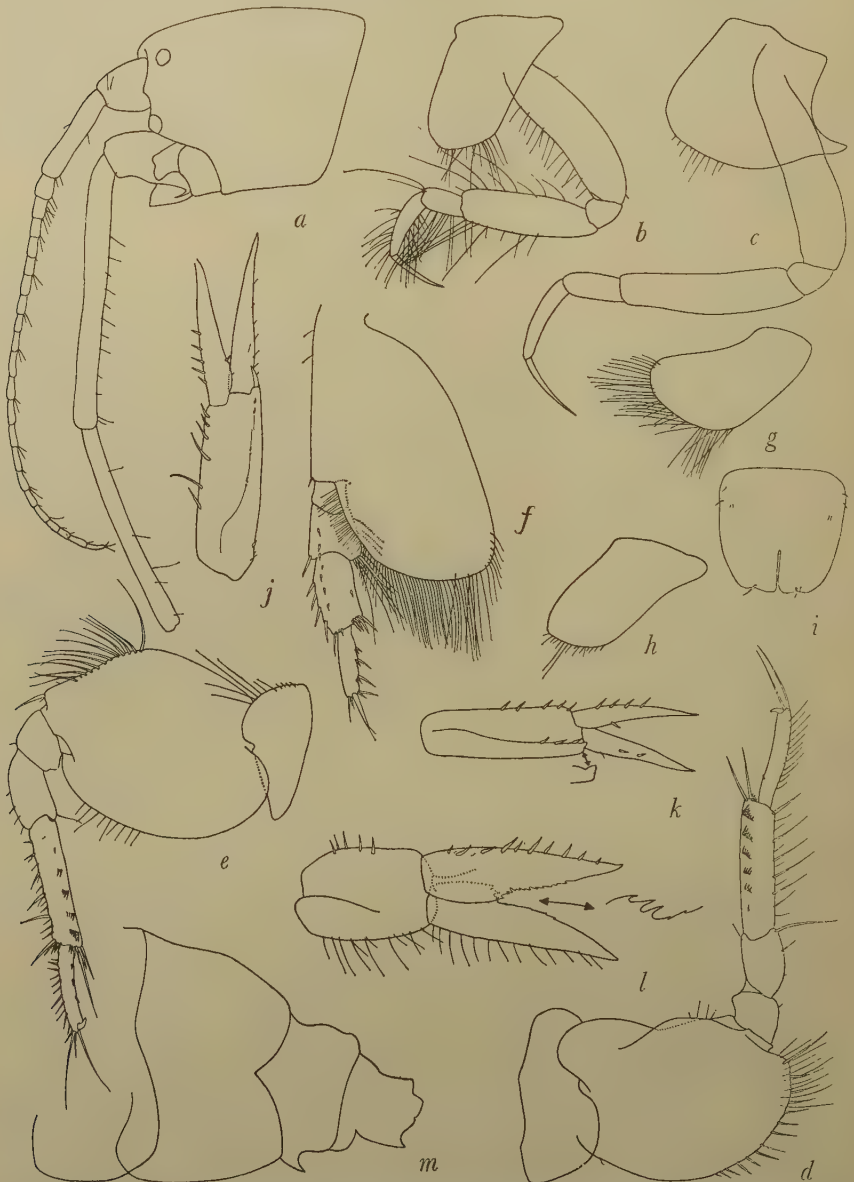

FIGURE 4.—*Byblis orientalis*, new species, male, holotype, 11.0 mm, *Albatross* 3769: *a*, head; *b–f*, pereopods 1–5; *g*, *h*, coxae 1, 2; *i*, telson; j–*l*, uropods 1–3, latter enlarged; *m*, pleonites 2–6, left to right (5–6 coalesced).

Material: *Albatross* 3767 (2), 3769 (9), 3771 (1 specimen, the largest, 16 mm).

Records: Oboro Saki; Nagane Saki; and Doumiki Saki, Honshu Island, Japan, 18–61 fms.

Relationship: Differing from *B. rhinoceros* Pirlot (1936) to which it is closely related in view of antenna 1, head, telson, uropod 3, pereopod 5 articles 3–7, and uropods 1 and 2, by the slightly more quadriform posterodistal corner of article 2 of pereopod 5, and by the considerably shorter first antenna of the female. In many respects this species also resembles *B. crenulata* Pirlot (1936) which is close to if not identical with *B. daleyi* Giles (Pirlot's, 1936, identification of *daleyi* did not account for the extremely long second article of antenna 1), but the head and eyes of *B. crenulata* differ, the lower lens pointing more ventrally, the anterior edge lacking a small protrusion, and the ventral margin of the head apparently not being strongly excavate for the attachment of antenna 2. Article 2 of antenna 1 is subequal to article 1 in contrast to *B. orientalis* and the anterior coxae are serrate ventrally. In addition, article 7 of pereopod 5 is much shorter in *B. crenulata* than it is in *B. orientalis*.

The new species is also related to Pirlot's (1936) identification of *B. daleyi*, but article 2 of antenna 1 is much shorter than in that individual; however, one aberrant specimen of *B. orientalis* in sample 3138 has left and right antennae dissimilar, the left with article 2 more than twice as long as article 1, the right with article 2 scarcely longer than article 1.

This species also resembles a new species to be described by M. Imbach from the South China Sea but differs from it by the sparsity of spines on the "posterior" edge of article 6 on pereopod 3, by the less attenuated and asymmetrical lobe of article 2 on pereopod 5, by the slightly shorter first antennae, the slightly deeper cleft of the telson, the stronger posterior cusp of coxa 4, and the thinness of the setae on the outer ramus of uropod 3. Those two species may be races of a common stem.

Distribution: Honshu Island, Japan, 33–112 m.

Haploops spinosa Shoemaker

Haploops spinosa Shoemaker, 1931, pp. 13–18, figs. 5, 6.
Haploops tubicola.—J. L. Barnard, 1960, p. 35. [Not Liljeborg.]

Barnard overlooked the row of spines on article 3 of pereopod 5 in his misidentification of 1960.

Material: *Albatross* 3698 (1).

Record: Honshu Island, Japan, 153 fms.

Distribution: Western Atlantic Ocean, Bay of Fundy, and Nova Scotia, 22–2300 m; eastern Pacific Ocean, near Pt. Conception, Calif., 117–171 m; Honshu Island, Japan, 250 m.

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